3D Design and 3D Printing Of Architectural Models

Kerry Parker, Braden Ellis, Kelly Root

Whiteclouds 3D Printing

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3D Design/Modeling and 3D Printing of Architectural Models

Key learning objectives

At the end of this class, you will be able to:

- **Understand The 3D Printing Process And How It Works.**
- **Understand The Limitations, Possibilities and advantages to 3D Design And Printing.**
- **Discuss Firsthand With Our Presenters What File Types Are Acceptable.**
- **Understand The File Conversion Process And What Is Required To Make A File Printable.**
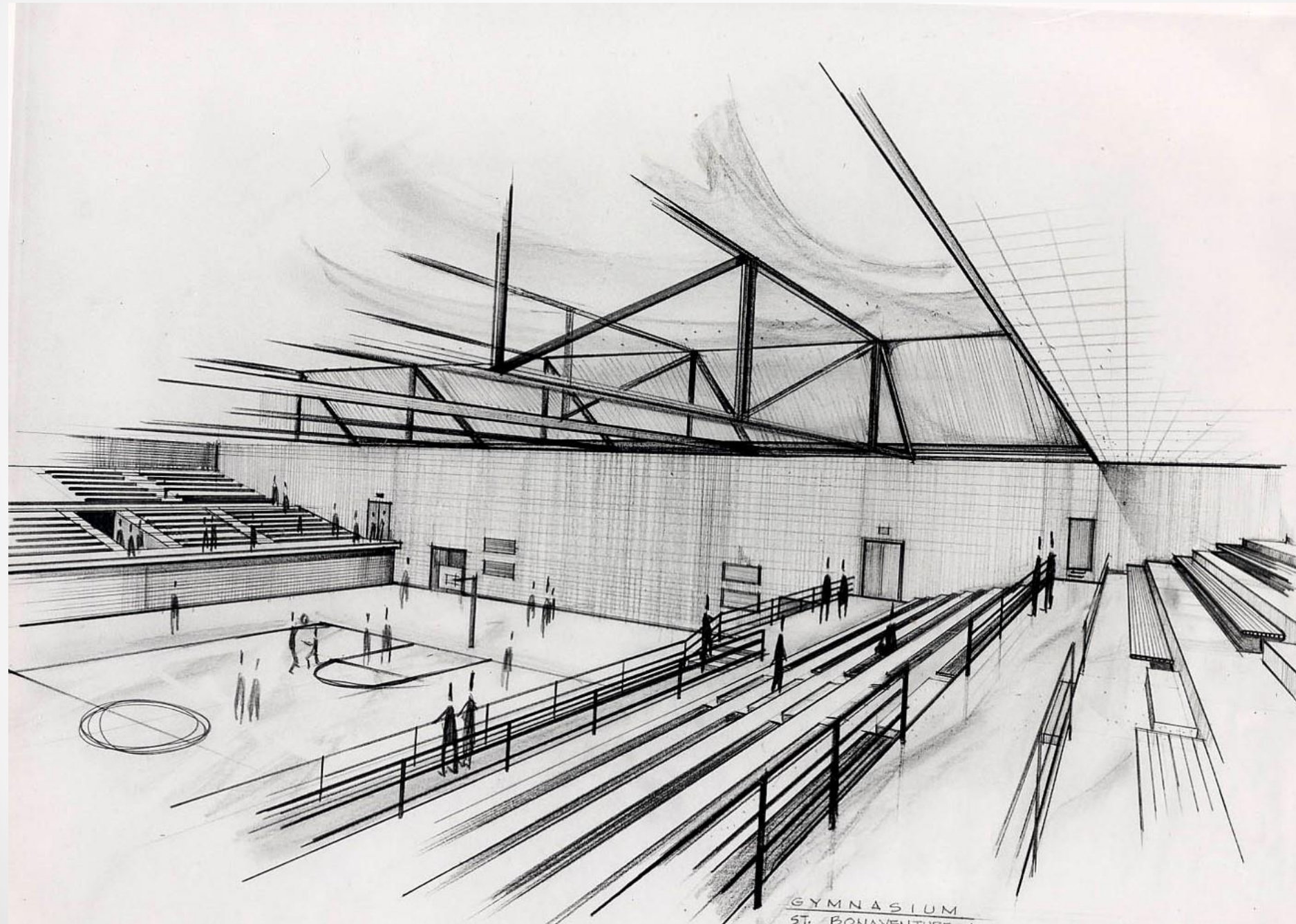
white**clouds**

- **Established In January 2013**
- **Located In Ogden, Utah**
- **3D Printing/ 3D Design Services**
- **Currently The Worlds Largest Powder Printing Service Bureau**
- **41 Production Printers Onsite**
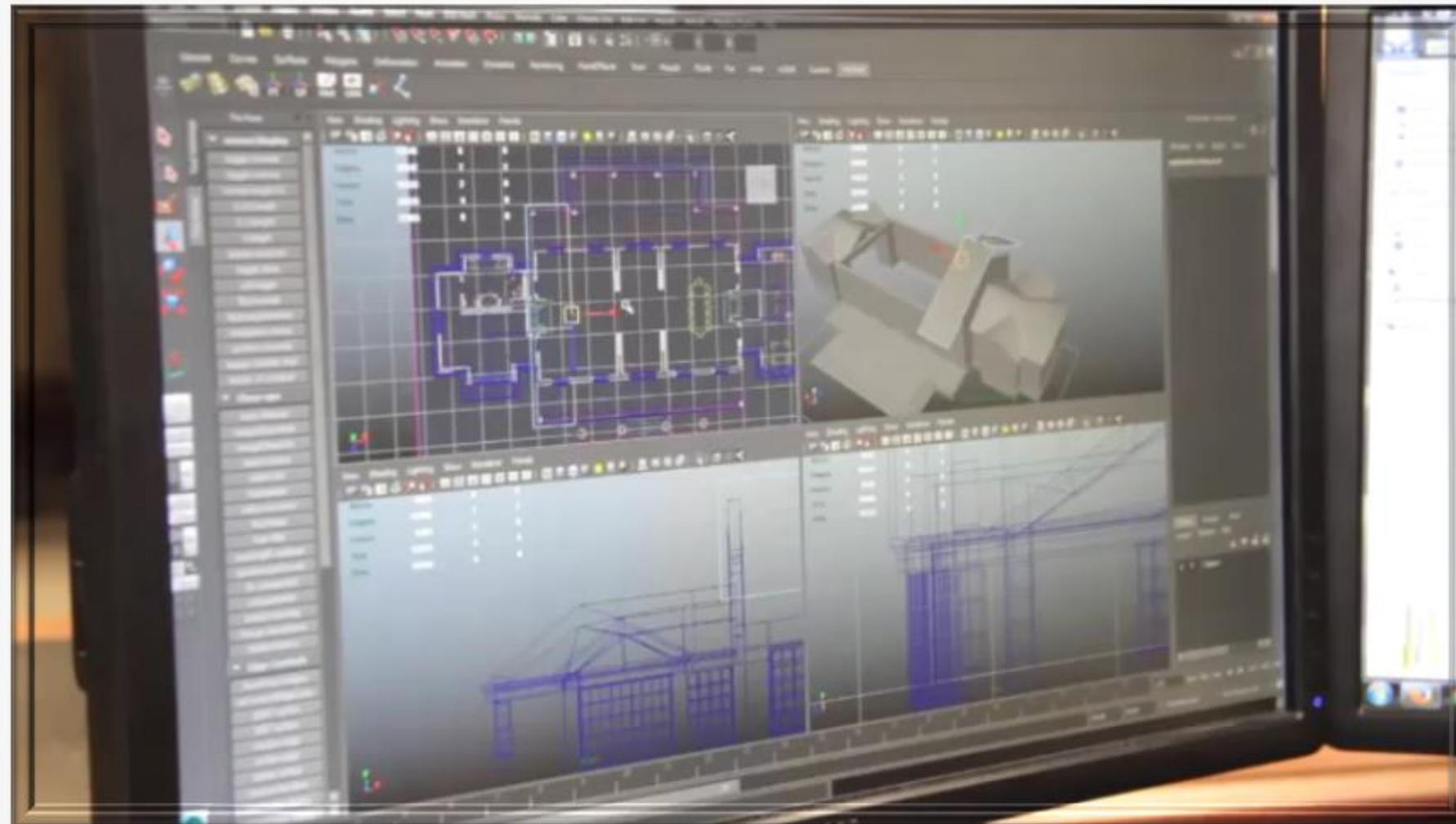- **Architectural, Prototyping, Entertainment, Medical**

The 3D Printing Process

- **History Of 3D Printing**
- **First Patent Issued In 1986**
- **Powder-jet Printing**
- **Multi-jet Printing**
- **Post Processing**

The Design Process

GYMNASIUM
ST. BONAVENTURE

3D Architectural Modeling

Types Of Architectural Models

- Laser Cut Foam   Residential

- Foam Boards   Topographical

- Cardboard   Landscape

- Balsa Wood   CityScapes

- PolyStyrene   Exterior/Interior

- 3D Printed   Massing

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Limitations, Possibilities & Advantages

Limitations

- 2mm Wall Thickness Required
- Watertight
- Size

Limitations, Possibilities & Advantages

Possibilities

- Lifelike Resemblance
- Lighting
- Hybrid Model
- Topo From Google Earth
- Presentation Elements(lights, interiors, working models)

Limitations, Possibilities & Advantages

Advantages

- See It, Hold It, Before You Build It
- Environmental Conditions
- Revisions Before Final Build
- Communications With Clients
- Fund Raising
- HOA Or Cities That Require A Model To Build
- Bid Openings

Acceptable File Types & Software

.obj
- Universal
- Contains Texture Information
- Not A Final Print File Format

.wrl
- Wide Spread
- Contains Texture Information
- Final Print File Format For A Variety Of Printers, Particularly Color

Acceptable File Types & Software

.fbx
- Autodesk Software Specific
- Contains Texture Information
- Not A Final Print File Format

.stl
- Universal
- Does Not Contain Texture Information
- Final Print File Format For A Wide Variety Of Printer Technologies

Acceptable File Types & Software

.dae
- Fairly Wide Spread
- Contains Texture Information
- Not A Final Print File Format

.3ds
- Native To 3DS Max
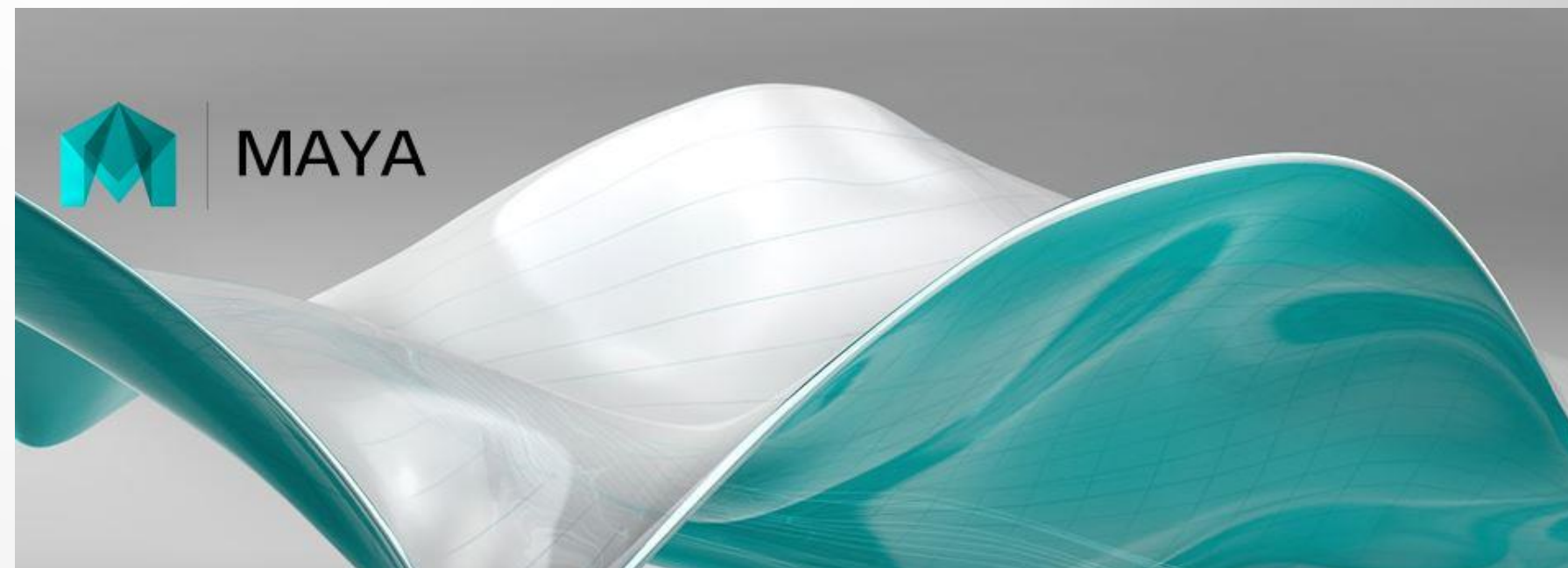- Contains Texture Information

.x3d
- Fairly Wide Spread
- Contains Texture Information

The File Conversion Process
What Is Required To Make A Printable File?

Autodesk Maya: .obj, .wrl, .fbx, .stl, .dae
- Can Create Files For A Wide Variety Of Fields
- Can Use And Create Textures For Final Printed Files
- A Wide Variety Of Tools Available To Create Printable Files
- Expensive
- Limited In Creating Objects To Exact Specific Dimensions And Scales
- Steep Learning Curve

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The File Conversion Process
What Is Required To Make A Printable File?

3DS Max: .obj, .wrl, .fbx, .stl, .dae, .3ds, .x3d

- Can Create Files For A Wide Variety Of Fields
- Can Use And Create Textures For Final Printed Files
- A Wide Variety Of Tools Available To Create Printable Files
- Expensive
- Limited In Creating Objects To Exact Specific Dimensions And Scales
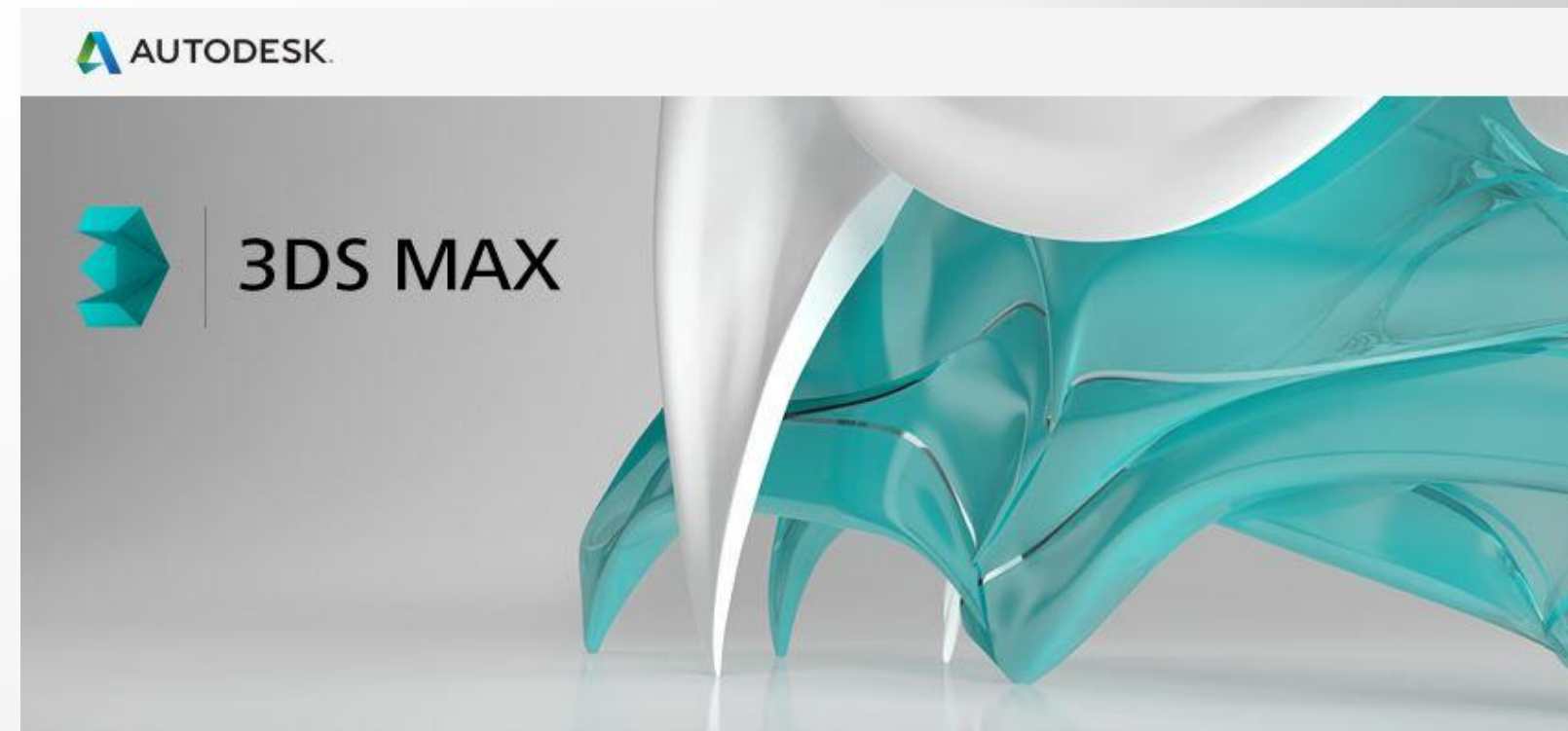- Steep Learning Curve

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The File Conversion Process
What Is Required To Make A Printable File?

Revit: .fbx
- Excels At Architecture
- Able To Create Models To Exact Dimensions And Scale
- Can Create Basic Models Ready For 3D Printing
- Only Simple Models Can Be 3D Printed, More Complex Models Need Editing In Other Software
- Textures Do Not Transfer Correctly To Other 3D Modeling Software Or Printers
- Steep Learning Curve
- Expensive

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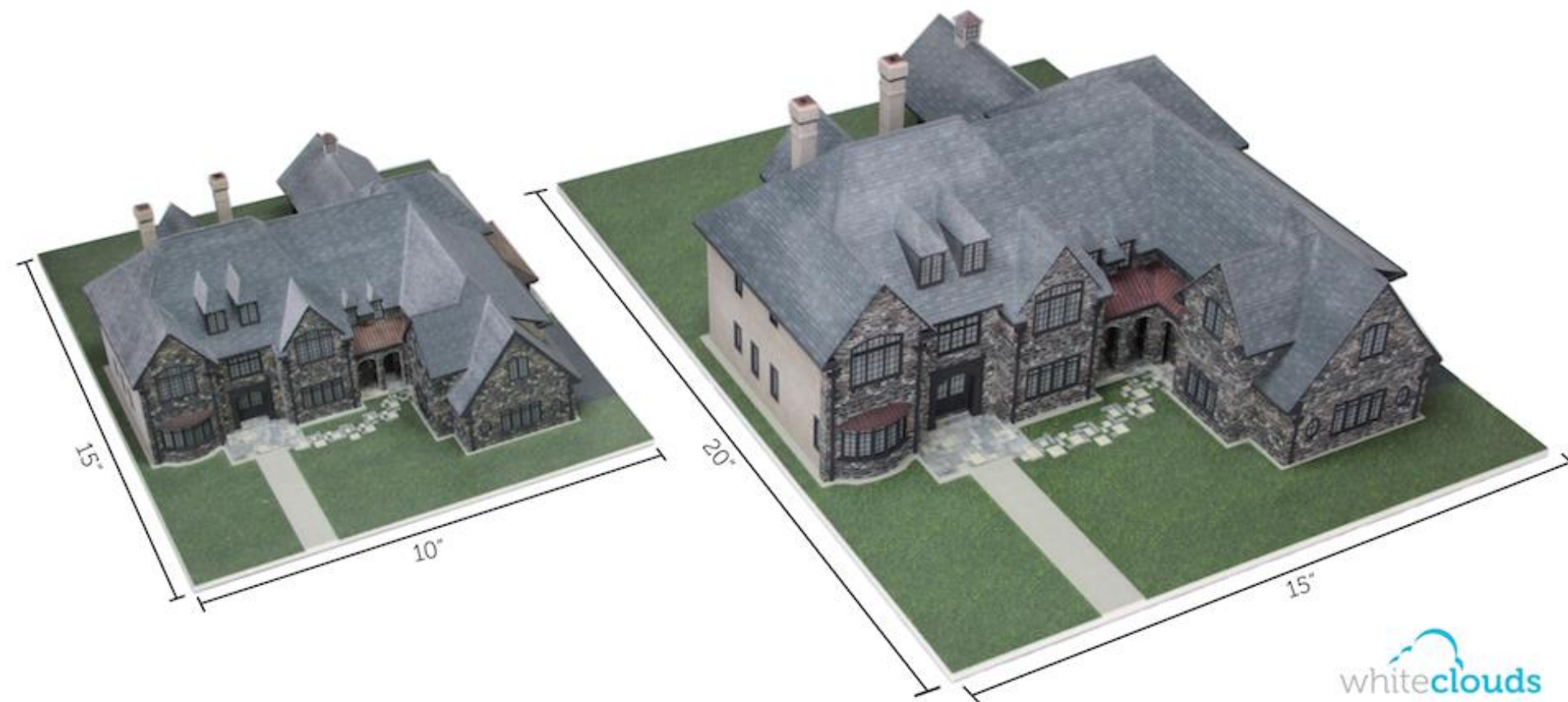# Live Demonstration

(Kelly with laptop)

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3D Printed Models
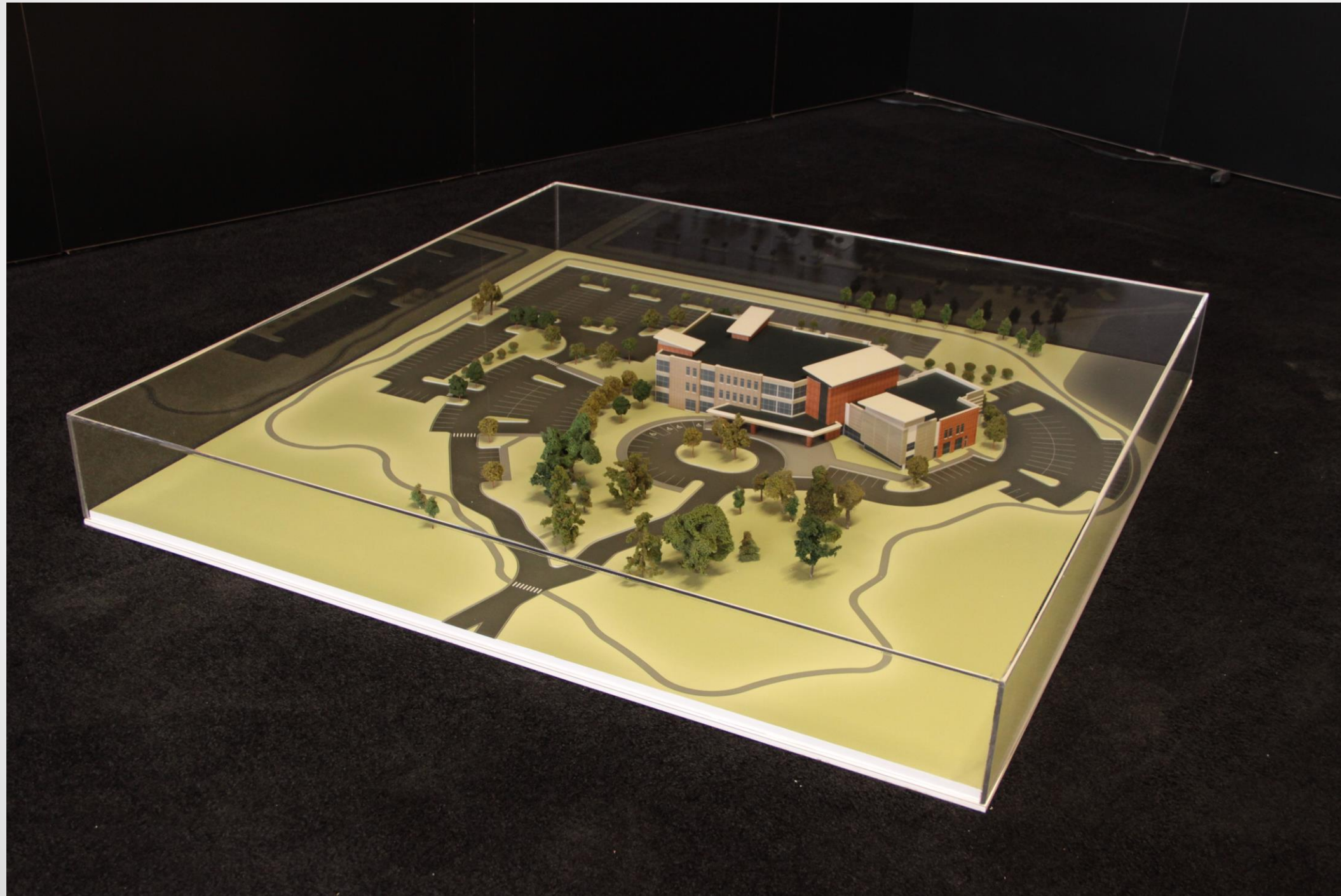
3D Printed Models With Vinyl Topography

One Piece Model Size Limitations

3D Printed Model, Vinyl Overlay With Landscaping

- Place Holder For:

- USS Arizona
- INL
- Jaffa

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Acceptable File Types   **Acceptable Sources**

Revit   BluePrints - Paper

Sketchup   Floorplans – PDF's

                             JPEG Images

STL   Artist Sketches

OBJ

3DS

Home Design Software

Many Others

File Manipulation Tools

Manipulation of Content

Addition of Textures, Colors

Fixes-Making Watertight

Proper Scaling – Walls, Columns, Railings

Hollowing

Connectivity Planning for Multiple Build Trays

Machine Specific Control Software